NEW REGULATIONS MEMO
New Well Construction/Pump Installation Regulations

From: Tom Christopherson, Manager Water Well Standards Program Date: July 22, 2014
To: Licensed Water Well Contractors
Subject: Revisions of Chapter 12 regulations for the construction, decommissioning of water wells and the installation of pumps and pumping equipment.

Summary: Title 178 NAC 12 regulations have been revised by the Water Well Standards and Contractors' Licensing Board and the Department of Health of Human Services in order to incorporate information that was learned from the Nebraska Grout Task Force clear cased research project for the enhancement of public health and ground water protection. These revisions are in the final stages of the review and approval process and are expected to become effective within the next few weeks. Once the regulations become official you will receive notification where to find a copy for your business. The final version will also be posted on our web site ***dhhs.ne.gov/publichealth/Pages/enh_wwsindex.aspx***. If you are subscribed to the web site you will be automatically notified by email when the posting is made.

The following is a synopsis of some of the major changes and additions to Title 178 NAC 12. PLEASE READ AND FOLLOW THE FINAL REGULATIONS WHEN THEY BECOME EFFECTIVE.

12-002 Definitions

Annular Fill (new) - refers to the materials to be placed between the primary seal and surface seal.

Aquifer Seal (new) - refers to the primary seal and the surface seal and where they're placed in the borehole.

Ground Water Heat Pump Well (addition/revision) - includes language defining the entire closed loop system, boreholes, header piping, circulating pump and circulating fluid as a water well under the authority of the Water Well standards and Contractors Practice Act. Makes a distinction between horizontal and vertical closed loop system.

Observation Well (addition/revision) - defined as a non-potable water well for the purpose of measuring water level and collecting water samples, not located in a zone of contamination.

Primary Aquifer Seal (new) - defined as a non-slurry chip bentonite grout interval placed deep in the borehole, just above the screen, or the bottom of the first clay layer above the screen, or the static water level wherever the seal provides the best protection to the ground water.

Well Development (addition/revision) - language defining the process of well development and the methods, chemical and actions needed to restore the aquifer after the drilling process.

Well Pit (new) - defines a well pit as a subsurface structure that houses a pump or pumping equipment and is large enough for a person to enter the structure to work such equipment.

12-003 General Requirements

12-003.01 Protection and Location (addition-revision) - this section has been rewritten to include protection to the ground water by prohibiting a well to be located in a well pit, requiring protection from the 100 year floods, and reformatted to easily identify set back distances in a bulleted chart. These include separation from public supply water wells, industrial and irrigation wells from different owners, lagoon, septic tanks and lateral, confined animal feed pen, cesspools, sewer lines, sources of known contamination, hydrants, storm water ways and well pits. In addition there are provisions that if a well is constructed with full length non-slurry bentonite chip grout the contractor may locate a well within 50% of the setback distances found in Chart 2, excluding the setbacks from public water supply wells and irrigation/industrial wells from different owners without requesting a declaratory order from the Department as long as the Department is notified in advance of the construction of the well. Any well location less than the 50% of the established set back distances found in Chart 2 would still require a declaratory order request before construction.

12-003.06 Grout (addition/revision) - language prohibiting additives containing fly ash from cement grouts, revised recipes for ***Neat Cement*** by reducing water content to 5.2 gallons per 94 lb. bag of Portland cement, eliminates concrete as a grout, defines ***Non-Slurry Bentonite*** as chip/chunk bentonite, ***Cement/Bentonite*** as 94lbs. Portland cement plus 3-5 pounds of bentonite and 6.5 gallons of water, ***High Solids Bentonite*** slurries to include soda ash, 4 to 1 ratio of sand to 20% active solids bentonite and additives to maintain permeability at $1x10^{-7}$ cm/sec, "high water" ***Bentonite*** slurry as soda ash, 20% bentonite and additives to maintain permeability at $1x10^{-7}$ cm/sec.

12-003.07 Placement of grout (addition/revision) - language requiring a 2-4 foot interval of fine sand between non-slurry bentonite and cement based grouts and provisions for the placement of non-slurry bentonite to avoid bridging.

12-003.08 Aquifer Protection (new) - language defines the 5 foot Primary Seal of non-slurry bentonite grout to be placed above the screen, at the first clay layer above the screen or at or immediately below the static water level; whichever provides the best protection. Bored wells are exempt from the primary seal requirement.

Defines Annular Fill material as either non-slurry bentonite grout or a combination of non-slurry bentonite and gravel or sand and granular bentonite or high solids bentonite slurry or sand/gravel and drilling fluid with bentonite or cement based grouts.

12-003.11 Repairing a potable well (addition/revision) - language clarifies that only the portion of the well being repaired must meet current standards for the use of material, construction or design.

12-004 Potable well

12-004 Potable well construction (new) - requires the contractor to verify the purpose of the well to determine if the well will be a public water supply well.

12-004.03 Shock Decontamination (new) - language requiring the contractor to supply the landowner with an informational brochure telling him/her why they should have the water tested and what those test results mean. ***DHHS will supply a template for the brochure.*** Tables are revised to indicate amounts of disinfectant needed to achieve 200 PPM chlorine.

12-005 Non-Potable Wells **12-005.01** Driven Sand Point wells (addition/revision) - language clarifies driven sand point wells ***are for temporary use only*** and must be ***decommissioned after 90 days***. Observation wells must be located in accordance with the 100 foot setback chart in 12-003.01C

12-005.02A Non-potable (addition/revision) - livestock, observation, industrial, irrigation, dewatering with outside diameter (OD) of 6- 5/8 inch or less must be fitted with a watertight steel segment through the frost zone or be sleeved with a metal sleeve through the frost zone and the sleeve must be grouted between the sleeve and the borehole and the sleeve and the inner casing. Effectively eliminates the concrete pad for non-potable small diameter wells.

12-005.05 Wells in the Arikaree formation (new) - clarifies regulations requirement for large non-potable wells (greater than 6-5/8 inch in diameter) wells construction with gravel pack chutes. Places geographic limits of construction to the Arikaree formation subject to subsidence.

12-007 Ground Water Monitoring and Recovery Wells; **12-007.08** Temporary Well Design (new) - clarifies the use of direct push or CPT as a temporary well design good for 90 days if the Department is notified 30 days in advance of construction.

12-008 Public Water Supply Systems; **12-008.01** Community Public Water Supply Wells (new) - clarifies what is a community public water supply well and identifies Title 179 as the authority over such wells

12-008.02 Non-Community Public Water Supply Wells (new) - gives examples of non-community public water supply wells and tells when they may be constructed under 178 NAC 12 standards: Contractor may drill and locate non-community well in accordance with Title 178 if the well pumps less than 100 GPM and the top of the screen is greater than 50 feet below the surface and is located further than 200 feet from surface water and the owner provides the contractor in writing confirmation from the Department that the well may be constructed compliance with Title 178.

12-008.03 (new) - requires any public water supply well not meeting the requirements of 12-008.01 and 12-008.02 to be constructed under Title 179 chapter 7.

12-010 Ground Water Heat Pump System; **12-010.02F** Pressure Testing (addition/revision) - defines standards for testing closed loop heat pump systems to include 100 psi for 6 hours with a maximum of 15% pressure drop allowing for pipe expansion. Anything greater that 15% in 6 hours will be considered a leak requiring repair or decommissioning of the faulty circuit.

12-010.02G Purging a loop system (new) - requires the purge rate of 5 cubic feet per second to remove air, debris and clean the closed loop circuit.

12-010.02H Circulating fluid (addition/revision) - defines food grade propylene glycol as the only acceptable circulating fluid and additives for corrosion inhibitors and biocide must be non-toxic, compatible with food grade propylene glycol, and non-hazardous upon disposal.

12-010.03A Systems with ***more than 10 boreholes*** (addition/revision) - requires full length ***grout with high solids bentonite*** slurry (4 to 1 sand to bentonite grout ratio). Prohibits the use of "high water" *bentonite* slurry for closed loop.

12-010.03B Systems with ***less than 10 boreholes*** located ***within 1000*** feet of PWS community well (new) - requires full length ***grout with high solids bentonite*** slurry (4 to 1 sand to bentonite grout ratio). Prohibits the use of "high water" *bentonite* slurry for closed loop.

12-010.03C Systems with ***less than 10 boreholes*** located ***over 1000*** feet of PWS community well (new) - requires full length grout with high solids bentonite grout or allows sand packing with bentonite fluids (dirty sand) annular fill. A 5 foot seal of ***non-slurry bentonite must be placed at the static water level and the top 30 feet*** of the borehole is required to be ***filled with non-slurry bentonite grout***. Prohibits the use of "high water" *bentonite* slurry for closed loop.

12-010.04B Closed loop constructed by Horizontal Drilling (new) - requires grouting of horizontal closed loop systems installed by horizontal drilling methods with ***High Solids Bentonite*** slurry. Prohibits the use of "high water" *bentonite* slurry for closed loop.

12-011 Installation of Pumps and Pumping Equipment: **12-011.01 General Requirements for pump installation applies to all types of pump installation.**

12-011.01B1 Disinfection (addition/revision) - language defines disinfection as a solution equivalent to 50 ppm chlorine. Tables are revised to indicate amounts of disinfectant needed to achieve 50 ppm.

12-011.01B2 (new) - language requiring a contractor to give the landowner a brochure telling them why the water should be tested after servicing the well and what those results mean. ***DHHS will supply a template for the brochure.***

12-011.02 Installation of Pumps - requires all pump installations to comply with 12-011.01-general requirements and 12-011.03-installation of pumping equipment. Language in this section details the installation of different types of pumps in subsections 12-011.02A-D for submersible, line shaft turbine, centrifugal, and reciprocating pumps.

12-011.03 Installation of Pumping Equipment - language in this section details the installation of pumping equipment in subsections 12-011.03A-H that include Pitless unit, Pressure Relief Valve, Backflow Prevention, Discharge piping, Sample point, Storage tanks, Above Ground Connections, and Well Pits.

12-012 Water Well Decommissioning; **12-012.01 General Requirements** (addition/revision) - language added to require any well constructed after 1988 but not constructed to Title 178 NAC 12 standards to have a declaratory order ruling prior to decommissioning.

12-012.07 Upper Plug (addition/revision) - language revised to allow only non-slurry bentonite or sand cement grouts to be used in upper plug.

12-012.07B Upper Plug Option 2 (addition/revision) - language revised to address well locations not located within a structure and having a surface seal. Specifies a 5 foot long plug of grout within the top 10 feet of the surface and a water tight cap.

12-012.07C Upper Plug Option 3 (new) - language for wells surrounded by concrete or asphalt that extends 1 foot beyond the original borehole. Requires a 5 foot plug of non-slurry bentonite to be installed from 10 to 5 feet below grade and the remaining 5 feet of well casing to be filled with concrete and struck level with the surface.